



U.S. Department of Commerce
BUREAU OF THE CENSUS
INDUSTRY AND TRADE ADMINISTRATION

Titanium Ingot, Mill Products, and Castings

SUMMARY FOR 1984

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SUMMARY OF FINDINGS

The total production of titanium ingot for 1984 totaled 79.9 million pounds. This represented a 51-percent increase from the 1983 figure of 52.9 million pounds. Consumption of titanium ingot increased 52 percent from 52.5 million pounds in 1983 to 79.7 million pounds in 1984. Net shipments of titanium mill products increased by 42 percent from 31.9 million pounds in

1983 to 45.4 million pounds in 1984. Castings shipments increased 9 percent to 532 thousand pounds in 1984 from 488 thousand pounds in 1983. The statistics in this publication are based on a survey of manufacturers and represent total U.S. shipment of titanium ingot mill products and castings. Estimates are included for companies whose reports were not received in time for tabulation. A more complete description of this survey appears on page 5.

Table 1. TITANIUM INGOT PRODUCTION, RECEIPTS, SHIPMENTS, CONSUMPTION, AND ENDING INVENTORIES:
1984 AND 1983

(Quantities in thousands of pounds)

Month and year	Production	Receipts	Shipments	Consumption	Ending inventories
1984					
Total ¹	79,929	17,618	15,537	79,695	(X)
January.....	6,835	1,520	860	6,917	9,050
February.....	6,695	1,192	792	7,107	8,490
March.....	7,355	1,178	1,060	7,096	8,480
April.....	7,312	1,347	1,381	7,337	7,983
May.....	7,074	1,123	1,863	7,329	8,095
June.....	6,871	1,106	1,454	6,307	9,091
July.....	7,247	1,764	1,776	6,139	8,901
August.....	6,015	1,511	1,481	6,648	7,928
September.....	6,287	1,378	1,255	5,843	8,594
October.....	6,534	2,193	1,120	6,979	7,931
November.....	5,858	1,483	1,266	6,529	7,265
December.....	5,846	1,823	1,229	5,464	7,548
1983					
Total ¹	52,878	11,345	10,884	52,465	(X)
January.....	3,544	892	621	3,698	4,938
February.....	3,698	839	977	3,560	5,020
March.....	4,310	1,181	1,151	4,354	5,017
April.....	3,657	746	918	3,446	5,141
May.....	3,769	968	1,002	3,665	5,221
June.....	5,048	924	945	5,168	5,052
July.....	4,148	1,141	867	3,608	5,994
August.....	4,361	961	805	4,814	5,920
September.....	5,045	950	950	5,372	5,527
October.....	4,799	890	873	5,068	5,472
November.....	4,745	994	968	4,770	5,523
December.....	5,754	859	807	4,942	6,546

(X) Not applicable.

¹Total inventory figures are those shown for December.

Table 2. TITANIUM INGOT MILL PRODUCTS AND CASTINGS: 1984 AND 1983

(Quantities in thousands of pounds)

Product description	Total	January	February	March	April	May	June	July	August	September	October	November	December
1984													
Mill products:													
Production.....	49,502	3,304	3,506	4,292	3,933	3,888	4,291	3,480	3,978	4,758	4,624	4,893	4,555
Sheet and strip.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Plate.....													
Forging and extrusion billet.....	27,818	1,838	1,968	2,466	2,296	2,297	2,184	1,957	2,255	2,666	2,512	2,625	2,754
Rod and bar.....	6,496	415	468	592	582	542	642	539	490	590	566	657	413
Fastener stock and wire.....													
Extrusions (other than tubing)...	15,188	1,051	1,070	1,234	1,055	1,049	1,465	1,984	1,233	1,502	1,546	1,611	1,388
Pipe and tubing.....													
Other.....													
Receipts.....	6,885	301	463	408	575	631	614	412	644	599	383	797	1,058
Sheet and strip.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Plate.....													
Forging and extrusion billet.....	6,044	221	378	358	534	583	559	353	598	515	275	694	976
Rod and bar.....													
Fastener stock and wire.....													
Extrusions (other than tubing)...	1,841	180	185	150	141	148	155	159	146	184	1108	1103	182
Pipe and tubing.....													
Other.....													
Net shipments ²	45,380	3,282	3,244	4,373	3,704	3,234	4,009	3,407	3,416	4,597	4,484	3,827	3,803
Sheet and strip.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Plate.....													
Forging and extrusion billet.....	23,809	1,854	1,688	2,676	1,976	1,644	1,892	1,666	1,657	2,530	2,459	1,841	1,926
Rod and bar.....	6,104	351	400	505	557	511	613	517	485	562	574	536	493
Fastener stock and wire.....													
Extrusions (other than tubing)...	15,467	1,077	1,156	1,192	1,171	1,079	1,504	1,224	1,274	1,505	1,451	1,450	1,384
Pipe and tubing.....													
Other.....													
Castings: ³													
Production.....	1,684	111	129	146	109	125	150	146	146	158	147	142	175
Shipments.....	532	27	44	44	34	40	52	36	47	59	45	47	57
1983													
Mill products:													
Production.....	34,647	2,651	2,418	2,887	2,567	3,021	3,132	2,577	2,845	3,546	3,020	2,864	3,119
Sheet and strip.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Plate.....													
Forging and extrusion billet.....	17,545	1,033	1,096	1,491	1,335	1,584	1,743	1,224	1,629	1,859	1,445	1,498	1,608
Rod and bar.....	4,389	241	306	258	317	291	458	350	354	390	490	447	487
Fastener stock and wire.....													
Extrusions (other than tubing)...	12,713	1,377	1,016	1,138	1,915	1,146	1,931	1,003	1,862	1,297	1,085	1,919	1,024
Pipe and tubing.....													
Other.....													
Receipts.....	4,143	168	224	191	198	422	355	314	432	735	314	360	430
Sheet and strip.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Plate.....													
Forging and extrusion billet.....	3,503	128	153	167	174	389	241	254	356	673	288	324	356
Rod and bar.....	(5)	-	-	(5)	-	-	(5)	-	(5)	-	-	-	-
Fastener stock and wire.....													
Extrusions (other than tubing)...	15,640	140	171	1524	124	133	15114	160	1576	162	126	136	174
Pipe and tubing.....													
Other.....													
Net shipments ²	31,866	2,665	2,633	2,876	2,479	2,691	2,642	2,287	2,437	3,050	2,656	2,547	2,903
Sheet and strip.....	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Plate.....													
Forging and extrusion billet.....	15,205	1,343	1,320	1,472	1,368	1,183	1,367	992	1,141	1,315	1,107	1,204	1,393
Rod and bar.....	4,316	230	335	262	303	310	412	351	356	394	486	423	454
Fastener stock and wire.....													
Extrusions (other than tubing)...	12,345	1,092	1,978	1,142	1,808	1,198	1,863	1,944	1,940	1,341	1,063	1,920	1,056
Pipe and tubing.....													
Other.....													
Castings: ³													
Production ⁴	1,005	83	104	100	94	81	84	48	71	85	75	77	103
Shipments.....	488	34	61	55	42	47	41	29	32	35	29	44	39

- Represents zero.

¹Data for sheet and strip, plate, extrusions (other than tubing), and pipe and tubing have been combined to avoid disclosing individual company data.²Net shipments is the sum of mill products shipments plus mill products consumed in the manufacture of fabricated products, less total receipts.³Includes gross weight of castings before machining.⁴Data for fastener stock and wire is included with extrusions, pipe and tubing and other to avoid disclosing individual company data.⁵Data for rod and bar have been combined with fastener stock and wire, extrusions, pipe and tubing, and other to avoid disclosing individual company data.

Table 3. NET SHIPMENTS, EXPORTS, IMPORTS, AND APPARENT CONSUMPTION OF TITANIUM INGOT, MILL PRODUCTS, AND CASTINGS: 1984

(Quantity in thousands of pounds)

Month	Manufacturers' net shipments	Exports of domestic merchandise ^{1 2}	Percent exports to manufacturers' net shipments	Imports for consumption ^{1 3}	Apparent consumption ⁴	Percent imports to apparent consumption
TOTAL						
Total.....	60,916	5,696	9	2,031	57,251	4
Titanium ingot and forging and extrusion billet ⁵	39,296	4,141	11	351	35,506	1
Titanium mill products.....	21,620	1,555	1	1,680	21,745	8
DECEMBER						
Total.....	4,663	456	10	168	4,375	4
Titanium ingot and forging and extrusion billet ⁵	2,786	293	11	52	2,545	2
Titanium mill products.....	1,877	163	9	116	1,830	6
NOVEMBER						
Total.....	4,619	470	10	138	4,287	3
Titanium ingot and forging and extrusion billet ⁵	2,633	340	13	48	2,341	2
Titanium mill products.....	1,986	130	7	90	1,946	5
OCTOBER						
Total.....	5,544	556	10	97	5,085	2
Titanium ingot and forging and extrusion billet ⁵	3,519	440	13	6	3,085	(Z)
Titanium mill products.....	2,025	116	6	91	2,000	5
SEPTEMBER						
Total.....	5,978	354	6	269	5,893	5
Titanium ingot and forging and extrusion billet ⁵	3,911	242	6	19	3,688	1
Titanium mill products.....	2,067	112	5	250	2,205	11
AUGUST						
Total.....	5,279	327	6	218	5,170	4
Titanium ingot and forging and extrusion billet ⁵	3,520	210	6	56	3,366	2
Titanium mill products.....	1,759	117	7	162	1,804	9
JULY						
Total.....	4,861	481	10	168	4,548	4
Titanium ingot and forging and extrusion billet ⁵	3,120	364	12	9	2,765	(Z)
Titanium mill products.....	1,741	117	7	159	1,783	9
JUNE						
Total.....	5,785	693	12	113	5,205	2
Titanium ingot and forging and extrusion billet ⁵	3,668	369	10	6	3,305	(Z)
Titanium mill products.....	2,117	324	15	107	1,900	6
MAY						
Total.....	4,715	584	12	169	4,300	4
Titanium ingot and forging and extrusion billet ⁵	3,125	467	15	12	2,670	(Z)
Titanium mill products.....	1,590	117	7	157	1,630	10
APRIL						
Total.....	4,959	486	10	178	4,651	4
Titanium ingot and forging and extrusion billet ⁵	3,231	423	13	46	2,854	2
Titanium mill products.....	1,728	63	4	132	1,797	7
MARCH						
Total.....	5,493	488	9	304	5,307	6
Titanium ingot and forging and extrusion billet ⁵	3,796	395	10	67	3,468	2
Titanium mill products.....	1,697	93	7	237	1,841	13
FEBRUARY						
Total.....	4,509	370	8	87	4,226	2
Titanium ingot and forging and extrusion billet ⁵	2,904	265	9	1	2,640	(Z)
Titanium mill products.....	1,605	105	7	86	1,586	5
JANUARY						
Total.....	4,511	431	9	122	4,202	3
Titanium ingot and forging and extrusion billet ⁵	3,083	333	11	29	2,779	1
Titanium mill products.....	1,428	98	7	93	1,423	7

(Z) Less than one-half of 1 percent.

¹See table 4 for comparison of Standard Industrial Classification (SIC) codes, Schedule B export numbers, and TSUSA import numbers.²Source: Bureau of the Census report FT-410, U.S. Exports--Schedule E--Commodity by Country.³Source: Bureau of the Census report IM 145-X, U.S. Imports for Consumption and General Imports.⁴Apparent consumption is derived by subtracting exports from the total of net shipments plus imports.⁵Comparability of output, export, and import classifications for ingot and billet assume that blown, sheet bar, and slab are reported as ingot or billet in the output codes. Figures for imports of ingot and billet also include powder, crystal, and similar forms which are excluded from the output and export codes.

Table 4. COMPARISON OF STANDARD INDUSTRIAL CLASSIFICATION (SIC) CODES, SCHEDULE B EXPORT NUMBERS, AND TSUSA IMPORT NUMBERS

Product code	Product description	Export number	Product description	Import number	Product description
33562 74 ¹	Titanium ingot and forging and extrusion billet	630.6520	Titanium ingots, billets blooms, sheet bars, and slabs	² 629.1460	Unwrought titanium metal, except sponge
33562 79	Titanium mill products	630.6570	Wrought titanium metal including alloys (excludes sponge ingots, billets blooms, sheet bars, slab, waste and scrap)	629.2000	Wrought titanium metal, including alloys (excludes waste, scrap, and unwrought metal

¹Comparability of output, export, and import classification for ingot and billet assume that bloom, sheet bar, and slab are reported as ingot or billet in the output numbers.

²Figures for imports of ingot and billet also include powder crystals and similar primary forms which are excluded from the output and export numbers.

DESCRIPTION OF SURVEY

Scope of Survey. This survey covers companies engaged in producing titanium ingot, mill products, and castings.

Survey Methodology. The statistics in this publication are collected by mail on Bureau of the Census quarterly Form ITA991, Titanium Metal. The panel for this survey includes all known producers of titanium ingot, mill products, and castings, approximately 30 companies.

Survey Error. Figures for the current month include estimates for panel members for which reports were not received in time for tabulation. Such missing figures are "imputed" based on month-to-month movements shown by reporting firms. Imputation generally is limited to a maximum of 10 percent for any one data cell. Figures with imputation rates greater than 10 percent are footnoted.

The imputation rate is not an explicit indicator of the potential error in published figures due to nonresponse because the actual monthly movements for nonrespondents may or may not closely agree with the imputed movements. The probable range of difference between the actual and imputed figures is not precisely known but is assumed to be small. The degree of uncertainty regarding the accuracy of the published data, however, increases as the percentage of imputation increases. Figures with imputation rates above 10 percent should be used with caution.

Revisions to Previous Period Data. Data may be revised as the result of corrected figures received from respondents or other corrections. Figures which have been revised by more than 5 percent from previously published figures are indicated by footnotes.

EXPLANATION OF TERMS

Gross Shipments of Mill Products. Represents mill shapes shipped between producers plus mill shapes consumed in the production of fabricated products such as forgings.

Net Shipments of Mill Products. Represents gross shipments less receipts. For detail categories, net shipments also includes consumption in the manufacture of other mill shapes.

Sheet and Strip. Flat roll mill products with thickness less than or equal to .187 inch.

Plate. Flat roll mill products with thickness exceeding .187 inch and greater than 10 inches wide.

Forging and Extrusion Billet. Rounds, squares, and rectangles with a cross-sectional area greater than or equal to 16 square inches and width less than 5 times thickness.

Rod and Bar. Rounds greater than ½ inch diameter and less than or equal to 4-½ inches in diameter. Squares with cross-sections less than 16 square inches. Rectangles with widths less than

or equal to 10 inches and thickness less than 3/16 and cross-sectional area less than 16 inches square.

Fastener Stock and Wire. Rounds with diameter less than or equal to ½ inch.

Extrusions (Other Than Tubing). Any product of any shape, except pipe and tubing, produced by forcing heated metal through a die.

Pipe and Tubing. All seamless and welded pipe and tubing.

Ingot. Includes direct casting of extrusion billet and other similar products.

Stocks. Equal to the end of the prior period plus production and receipts for the current period, minus consumption and shipments.

COMPARISON OF EXPORT, IMPORT, AND DOMESTIC OUTPUT DATA

The Standard Industrial Classification (SIC) system used for domestic output and the statistical export and import commodity classifications were developed independently. This results in considerable difficulty in comparing the three types of data for many commodity areas. The domestic output classification is based on type of industry; on the other hand, the export and import classification system is more materials oriented. Aside from the differences in the basic commodity classifications, there are additional problems involving import data, since there are a substantial number of imported commodities which are not produced in the United States or which are produced only in very small quantities and which, therefore, have no comparable domestic output classification. The relationships shown in this report should be considered only as approximations, since, in addition to the problems mentioned above, there are also the following problems affecting the comparability of the three sets of data.

Valuation. There are different methods of valuation for the three types of data:

- **Domestic Output.** Valued at the point of production. It includes the net sales price, f.o.b. plant, after discounts and allowances, exclusive of freight charges and excise taxes.
- **Exports.** Valued at the point of exportation. It includes the selling price, or cost if not sold, and inland freight, insurance and other charges to the export point.
Estimated producers' values of exports have also been developed. These values more closely approximate the values reported for domestic output because they exclude freight, insurance, and other charges applied from the producing plant to the export point.
- **Imports.** Valued at the first port of entry in the United States. It includes c.i.f. (cost, insurance, and freight), duty, and other charges to the import point.

Duplication in Quantity and Value of Output. Because producers' shipments of some commodities may be used as materials for incorporation into other commodities, combinations of data for such commodities may contain a certain amount of duplication. Thus, percentages of exports to output or imports to apparent consumption (output plus imports minus exports) at four-digit or broader levels may be understated. Where duplication is known to be substantial, the output data are appropriately noted in the table.

Low-Value Export and Import Transactions. Detailed commodity information is not included for individual import shipments valued at not more than \$250 or for individual export shipments valued at not more than \$500. This is believed to have only negligible effects on the statistics for the bulk of the commodities.

Manufacturers' Shipments, Not Specified by Kind. The value of manufacturers' shipments at the four-digit industry level often includes a small amount which is not distributed among the individual five-digit product classes. Export and import percentages at the more detailed levels might, therefore, be slightly overstated.

Time Lag Between Output and Exports. There will be a lag between the time a commodity is produced or shipped by the producer and the time it is actually exported, especially when intermediaries (wholesalers, exporters, etc.) are involved. Ordinarily, this type of discrepancy is insignificant in annual figures.

'Direct' vs 'Total' Commodity Exports and Imports. Export and import data do not include materials which are incorporated into other more finished products and exported or imported in finished form. Thus, by showing only direct exports and imports, the relation of exports to output and imports to apparent consumption for intermediate products is considerably understated.

Used Commodities. With a few exceptions, used or rebuilt commodities are classified in the same import or export codes as is new merchandise. Percentages are thus overstated to the extent that used or rebuilt products are significant in trade.

Geographic Area of Coverage. Import and export data reflect the movement of merchandise into and out of U.S. foreign trade zones, the U.S. Virgin Islands, and the U.S. customs territory (includes the 50 States, the District of Columbia, and Puerto Rico).

HISTORICAL NOTE

Data on titanium metal have been collected by the Bureau of the Census since 1955. Historical data may be obtained from Current Industrial Reports (called Facts for Industry before 1959) available at your local Federal Depository Library. A list of these

libraries may be obtained from the Bureau of the Census regional offices:

Office	Telephone
Atlanta, Georgia	(404) 881-2271
Boston, Massachusetts	(617) 223-2327
Charlotte, North Carolina	(704) 371-6142
Chicago, Illinois	(312) 353-6251
Dallas, Texas	(214) 767-0621
Denver, Colorado	(303) 234-3924
Detroit, Michigan	(313) 226-7742
Kansas City, Kansas	(816) 374-4601
Los Angeles, California	(213) 209-6616
New York, New York	(212) 264-3860
Philadelphia, Pennsylvania	(215) 597-4920
Seattle, Washington	(206) 442-7828

RELATED REPORTS

A monthly Current Industrial Report also is published in this series. The Bureau of the Census publishes the following related reports:

Series	Frequency	Title
<i>Current Industrial Reports</i>		
M33-2	Monthly	<i>Aluminum Ingot and Mill Products</i>
M33A	Monthly	<i>Iron and Steel Castings</i>
M33E	Monthly	<i>Nonferrous Castings</i>
MA33B	Annually	<i>Steel Mill Products</i>
MA33G	Annually	<i>Magnesium Mill Products</i>
<i>Other Industry Reports</i>		
M3-1	Monthly	<i>Manufacturers' Shipments, Inventories, and Orders</i>
(AS)	Annually	<i>Annual Survey of Manufactures (ASM)</i>
(MC)	Quinquennially	<i>Census of Manufactures</i>
<i>Foreign Trade Reports</i>		
EM 546	Monthly	<i>U.S. Exports—Schedule B—Commodity by Country</i>
IM 145-X	Monthly	<i>U.S. Imports for Consumption and General Imports</i>

CONTACTS FOR DATA USERS

Subject Area	Contact	Phone Number
Current Industrial Report ITA991	Don Burgess	(301) 763-7492
Manufacturers' Shipments, Inventories, and Orders	Ruth Runyan	(301) 763-2502
Census/ASM	Dale Gordon	(301) 763-7304
To order a Census Bureau publication	Customer Service (DUSD)	(301) 763-4100
Foreign Trade publication	Joyce Ware	(301) 763-5140

Subject Area	Contact	Phone Number
International Trade Administration	James Manion	(202) 377-5157

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